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# Comparative Advantage of Selected Agricultural Products in Hawai'i: A Revealed Comparative Advantage Assessment

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With the recent shutdown of Del Monte's pineapple plantation, Hawai'i's agriculture is moving further away from the era of sugarcane and pineapple plantations. In the new era of "diversified agriculture," an often-asked question is, Where lies Hawai'i's comparative advantage in agriculture?; i.e., Which of Hawai'i's agricultural products are relatively more competitive and stand a better chance to thrive in the long run, given national and world-wide competition? To answer this question, one needs to first evaluate the competition faced by each product to determine their respective competitiveness. Then Hawai'i's comparative advantage in each product can be assessed by comparing these products' competitiveness to one another. Hawai'i would have high comparative advantage in products where it has relatively high competitiveness.

This study uses the "revealed comparative advantage" (RCA) approach to assess Hawai'i's comparative advantage in selected agricultural products. The assessment provides systematic information about direct or indirect competition faced by Hawai'i's agricultural products, which can be useful for decision-making regarding sustainable agricultural development policies in Hawai'i.

## Method

Comparative advantage reflects relative competitiveness. Competitiveness can be measured by market shares. The larger Hawai'i's market share of a product's sales, the more competitive it is relative to other suppliers in the market. For example, if Hawai'i's market share of product A is greater than its market share of product B, then it is relatively more competitive in product A than

in product B; in other words, it has stronger comparative advantage in product A than in product B.

Based on the RCA approach, we measure Hawai'i's comparative advantage in agricultural products by the following index:

$$RCA_j = s_j / s$$

The RCA index thus defined compares Hawai'i's market share of each agricultural product ( $s_j$ ) to its average market share for all agricultural products under comparison ( $s$ ).<sup>(1)</sup> Hawai'i has above-average comparative advantage in products whose RCA scores are greater than 1. Hawai'i has stronger comparative advantage in products with higher RCA scores.

Competitiveness and comparative advantage are unlikely to be constant over time because of changes in

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<sup>(1)</sup>Comparative advantage measured by the RCA index is called "revealed" comparative advantage because market shares reflect competitiveness but do not explain the sources of competitiveness. The RCA approach was first introduced in Bela Balassa's 1965 paper "Trade Liberalization and 'Revealed' Comparative Advantage" in the Manchester School of Economics and Social Studies, volume 33, pages 92–123. For detailed discussion of the concept of comparative advantage and the RCA approach, see Junning Cai and PingSun Leung's paper "A Review of Comparative Advantage Assessment Approaches in Relation to Aquaculture Development" in *Species and System Selection for Sustainable Aquaculture*, Blackwell Publishing, July 2007.

consumers' preferences, production costs, transportation costs, regulations, etc. Variation of competitiveness can be measured by changes in market shares. An increase (or decrease) in market shares indicates competitiveness gain (or loss). However, it is usually not appropriate to directly use changes of RCA scores to measure variation of comparative advantage. The following formula provides a more precise measure of comparative advantage:

$$RCAV_j = C_{j,t+1} (RCA_{j,t+1} - \beta RCA_{j,t}) \times 100^{(2)}$$

The sign and value of RCAV scores indicate the direction and magnitude of comparative advantage variation over time. For example, a Hawai'i agricultural product's RCAV score of (+)5 indicates that Hawai'i has gained comparative advantage in this product, and if without the change in comparative advantage, sales of this Hawai'i agricultural product would have been 5 percent lower than its actual level. The implications for negative RCAV scores are the opposite. Note that the sum of RCAV scores for all the products is equal to zero. This captures the shift of comparative advantage among products. When Hawai'i becomes *relatively* more competitive in some products, it has to become *relatively* less competitive in other products.

## Data

In the U.S. market Hawai'i farmers face competition from U.S. mainland and foreign growers. We use the wholesale value of agricultural production to represent Hawai'i and U.S. mainland farmers' supplies of these products to the U.S. market, while the supplies of foreign farmers' are measured by the custom value of U.S. imports of these products.

Data on Hawai'i agricultural production are from Statistics of Hawai'i Agriculture (various issues); data on

U.S. mainland production are from Fruit and Tree Nuts Situation and Outlook Yearbook (2005) and Floriculture and Nursery Crops Situation and Outlook Yearbook (2005) published by the United States Department of Agriculture (USDA); and data on foreign imports are from the trade database of the USDA Foreign Agricultural Service.

The assessment is based on data in 2003. For assessment of comparative advantage variation, the comparative advantage situation in 2003 is compared to the situation in 1993.

## Results

The comparative advantage assessment covers 11 major agricultural products in Hawai'i, including two sugarcane products (raw sugar and molasses), four fruits (pineapples, papayas, bananas, and avocados), two tree nuts (coffee and macadamia nuts), and three floriculture products (anthuriums, fresh cut orchids, and potted flowering plants and foliage). Products mainly for Hawai'i's local consumption (e.g., vegetables and livestock) are excluded. Table 1 shows the RCA scores of the 11 agricultural products in 2003 and their RCAV scores between 1993 and 2003.

### Raw sugar (cane)

Hawai'i sales of raw sugar in 1993 was \$243 million, accounting for more than half of Hawai'i's total production of the 11 products under study. The production declined to \$96 million in 2003, which reduced Hawai'i's market share of raw sugar in the U.S. to 15 percent, only half of the 1993 level. Like Hawai'i, but to a lesser extent, the Caribbean and Oceania are the other two regions that reduced their market shares of raw sugar between 1993 and 2003 (Table 2). Central America and South America had the largest gain in market share between 1993 and 2003; the two regions accounted for nearly half of the U.S. raw sugar supply in 2003 (Table 2). In 2003, the largest raw sugar producers for the U.S. market (their market shares in parentheses) included Hawai'i (15%), Dominican Republic (12%), Guatemala (11%), the Philippines (9.5%), Brazil (9.2%), and Colombia (6.2%).

Hawai'i's RCA score in raw sugar was 2.62 in 2003, indicating that in spite of the large decline in production, Hawai'i still had above-average comparative advantage in raw sugar. But the RCAV score of -4.74 reflects a significant decline of Hawai'i's comparative advantage in raw sugar between 1993 and 2003 (Table 1).

<sup>(2)</sup>Derivation of the RCAV index can be found in Junning Cai and PingSun Leung's paper "Toward A More General Measure of Revealed Comparative Advantage Variation," which is forthcoming in *Applied Economics Letters*. The coefficient  $\beta$  is given by

$$\beta = (1 + g) \left( 1 + \sum c_{jt} g_j \right)^{-1}$$

$c_j$  denotes the ratio of Hawai'i's supply of each agricultural product in its total supply of all agricultural products;  $t$  and  $t+1$  are time-subscripts.  $g_j$  and  $g$  denote, respectively, the growth rate of each individual agricultural product and the average growth rate for all agricultural products.

### ***Molasses (cane)***

Hawai'i sales of cane molasses in 1993 was \$9 million, accounting for more than 20 percent of the U.S. market. The production and market share declined to \$3 million and less than 5 percent in 2003. The Caribbean (mainly the Dominican Republic) is another region that experienced large decline in cane molasses production for the U.S., losing nearly its entire 30 percent market share. Central America and South America had the largest gain in the U.S. molasses market; combined they supplied more than 60 percent of that market in 2003 (Table 3). In 2003, the largest cane molasses producers for the U.S. included Guatemala (23%), Brazil (13%), Australia (11%), Mexico (11%), Colombia (8.3%), Pakistan (7.9%), Costa Rica (6.0%), El Salvador (5.3%), and Hawai'i (4.6%).

The RCA score of 0.79 indicates that Hawai'i's comparative advantage in molasses was below average in 2003. The RCAV score of -1.60 indicates that its comparative advantage in molasses declined between 1993 and 2003 (Table 1).

### ***Pineapples***

Hawai'i sales of fresh pineapples in 1993 was \$80 million, accounting for more than 60 percent of the U.S. market. The production increased to \$100 million in 2003, but the market share was reduced by half. The Caribbean (mainly the Dominican Republic) and Southeast Asia (mainly Thailand) are other regions that lost market share in the U.S. pineapple market. Central America (mainly Costa Rica) picked up most of the pineapple market shares lost by other regions and accounted for more than 60 percent of the U.S. pineapple market in 2003 (Table 4). In 2003, the largest fresh pineapple producers for the U.S. included Costa Rica (59%), Hawai'i (31%), Ecuador (3.6%), Honduras (2.1%), Mexico (2.1%), and Thailand (1.6%).

The RCA score of 5.36 indicates that Hawai'i still had relatively high comparative advantage in pineapple in 2003. But the RCAV score of -4.74 indicates that Hawai'i's comparative advantage in pineapple significantly declined between 1993 and 2003 (Table 1).

### ***Papayas***

Hawai'i sales of papayas in 1993 was \$13.5 million, accounting for 60 percent of the total U.S. market for fresh papayas. The production declined slightly to \$13 million in 2003, but the market share declined significantly to

18 percent. The Caribbean also reduced its U.S. papaya market share from 11 percent in 1993 to less than 5 percent in 2003. North America (mainly Mexico) had nearly 60 percent of the U.S. papaya market in 2003, 35 percent higher than the 1993 level. Central America and South America are other regions that increased U.S. papayas market share between 1993 and 2003 (Table 5). In 2003, the largest papaya producers for the U.S. fresh market included Mexico (59%), Hawai'i (18%), Belize (11%), Brazil (7.7%), and Jamaica (3.4%).

The RCA score of 3.05 indicates that Hawai'i still had relatively high comparative advantage in papayas in 2003. But the RCAV score of -3.83 indicates that the advantage declined significantly between 1993 and 2003.

### ***Bananas***

Hawai'i sales of bananas in 1993 was \$4.4 million, accounting for less than half a percent of the U.S. market. The production increased to \$9.2 million in 2003, and the market share increased to nearly 1 percent (Table 1). North America (mainly Mexico) held nearly 10 percent of the U.S. banana market in 1993, which declined to one percent in 2003. Central America and South America held 61 percent and 37 percent, respectively, of the U.S. banana market in 2003. Central America increased its banana market share by nearly 10 percent between 1993 and 2003, but South America's share dropped slightly by one percent (Table 6). In 2003, the largest banana producers of the U.S. included Costa Rica (26%), Ecuador (24%), Guatemala (24%), Colombia (12%), and Honduras (11%).

The RCA score of 0.16 indicates that Hawai'i revealed a small comparative advantage in bananas in 2003, but the RCAV score of 1.99 indicates that its comparative advantage in bananas increased between 1993 and 2003 (Table 1).

### ***Avocados***

Hawai'i sales of avocados in 1993 was \$220,000, accounting for less than 0.1 percent of the U.S. market. The production increased to \$470,000 in 2003, but the market share stayed almost the same (Table 1). U.S. mainland producers supplied nearly the entire U.S. avocado market in 1993, but the market share declined to 71 percent in 2003. South America (mainly Chile) and North America (mainly Mexico) accounted for most of the market share loss by the U.S. mainland (Table 7). In 2003, the largest avocado producers for the U.S. market included the

U.S. mainland (71%), Chile (16%), Mexico (8 %), and Dominican Republic (3%).

The RCA score of 0.02 indicates that Hawai'i had little comparative advantage in avocados in 2003, but the RCAV score of 0.06 indicates that Hawai'i's comparative advantage in avocados increased slightly between 1993 and 2003 (Table 1).

### **Coffee (green)**

Hawai'i sold \$6.5 million of green coffee in 1993, accounting for 0.5 percent of the U.S. market. The production and market share increased to \$24 million and 1.7 percent in 2003 (Table 1). South America and Central America held 46 percent and 29 percent, respectively, of the U.S. green coffee market in 2003, which were 4 percent higher than their respective levels in 1993 (Table 8). In 2003, Southeast Asia held 11 percent of the market, 3 percent higher than the 1993 level. In contrast, North America (mainly Mexico) reduced its market share from 17 percent to 6 percent. In 2003, the largest coffee producers for the U.S. market included Colombia (23%), Brazil (18%), Guatemala (14%), Costa Rica (7.4%), Mexico (6.3%), Indonesia (5.5%), and Viet Nam (5.0%).

Hawai'i faces more competition in the coffee market than in its other major export markets such as sugar products, pineapples, papayas, macadamia nuts, and floriculture products. The RCA score of 0.29 indicates that Hawai'i had relatively low comparative advantage in green coffee in 2003, but the RCAV score of 6.01, the greatest among the 11 products under comparison, indicates that Hawai'i's comparative advantage in coffee increased significantly between 1993 and 2003 (Table 1).

### **Macadamia nuts**

In 1993, Hawai'i sold \$33 million of macadamia nuts, accounting for 66 percent of the U.S. market. The production declined slightly to \$32 million in 2003, but the market share declined significantly to 37 percent (Table 1). Sub-Saharan Africa picked up most of Hawai'i's market share loss, increasing its market share from 6 percent in 1993 to 28 percent in 2003. South America (mainly Brazil) and East Asia (mainly China) have also increased their market shares (Table 9). In 2003, the largest macadamia nuts producers for the U.S. market were Hawai'i (38%), South Africa (18%), Australia (16%), Kenya (6.5%), Guatemala (5.2%), Brazil (4.4 percent), China (3.2%), Malawi (2.4%), and Costa Rica (2.4%).

The RCA score of 6.48 indicates that Hawai'i had relatively high comparative advantage in macadamia nuts in 2003. The RCAV score of -0.21 indicates that Hawai'i's comparative advantage in macadamia nuts declined slightly between 1993 and 2003 (Table 1).

### **Anthuriums (fresh cut)**

Hawai'i sold \$7.2 million of fresh cut anthuriums in 1993, accounting for 88 percent of the U.S. market. The production declined to \$5.8 million in 2003, but the market share increased to 93 percent (Table 1). From 1993 to 2003, North America (mainly Canada) increased its anthuriums market share from virtually zero to 4.3 percent, while the Caribbean reduced its market share from 7.9 percent to 1.6 percent (Table 10). In 2003, the largest anthuriums producers for the U.S. market were Hawai'i (93%), Canada (4.3%), and Trinidad and Tobago (1.4%).

The RCA score of 16.12 indicates that Hawai'i had very high comparative advantage in anthuriums in 2003; and the RCAV score of 0.80 indicates that Hawai'i slightly increased its comparative advantage in anthuriums between 1993 and 2003 (Table 1).

### **Orchids (fresh cut)**

Hawai'i sold \$3.5 million of fresh cut orchids in 1993, accounting for 26 percent of the U.S. market. The production and market share increased to \$4.7 million and 36 percent in 2003 (Table 1). Most of Hawai'i's market share gain came from the market share loss by U.S. mainland orchid growers, which declined from 38 percent in 1993 to 29 percent in 2003. Southeast Asia (mainly Thailand) is another major supplier of fresh cut orchids to the U.S. market, accounting for 23 percent of the market in 2003 (Table 11). Hawai'i, Thailand, and Colombia were the largest suppliers of fresh cut dendrobiums to the U.S. in 2003; their market shares were 54 percent, 38 percent and 5.2 percent, respectively. As for fresh cut orchids other than dendrobiums, the U.S. mainland and Hawai'i accounted for 51 and 22 percent of the supply, respectively; other smaller suppliers included Netherlands (8.0%), New Zealand (6.1%), Singapore (5.4%), and Thailand (4.5%).

The RCA score of 6.26 indicates that Hawai'i had relatively high comparative advantage in fresh cut orchids in 2003. The RCAV score of 0.48 indicates that Hawai'i slightly increased its comparative advantage in fresh cut orchids between 1993 and 2003.

**Potted flowering plants and foliages**

Hawai'i sold \$29 million of potted flowering plant and foliages, accounting for 2.4 percent of the U.S. market. The production and market share increased to \$39 million and 2.7 percent in 2003 (Table 1). As foreign flowers and plants are not allowed to enter the U.S. in pots, U.S. mainland growers are Hawai'i's only competitors in potted flowering plants and foliages. Mainland growers held 97 percent of the market in 2003.

The RCA score of 0.47 indicates that Hawai'i still had relatively small comparative advantage in potted flowering plants and foliages in 2003, but the RCAV score of 5.79 indicates that Hawai'i significantly increased the advantage between 1993 and 2003 (Table 1).

**Summary**

We use market shares to measure Hawai'i's competitiveness in 11 selected agricultural products. From 1993 to 2003, Hawai'i increased its market shares of five products, including fresh cut orchids (by 10 percent), anthuriums (by 5 percent), coffee (by 1 percent), bananas (by 0.4 percent), and potted flowering plants and foliages (by 0.3 percent). During the same period, Hawai'i reduced its market shares of five products, including papayas (by 43 percent), pineapples (by 31 percent), macadamia nuts (by 29 percent), cane molasses (by 17 percent), and cane raw sugar (by 15 percent). Hawai'i's market share of avocados remained virtually unchanged.

We use the RCA index to measure Hawai'i's comparative advantage in the 11 products, which essentially compares its competitiveness among these products. In 2003, Hawai'i had above-average comparative advantage in six of these products, including anthuriums (with RCA score of 16.12), macadamia nuts (6.48), cut orchids (6.26), pineapples (5.36), papayas (3.05), and raw sugar (2.62). Hawai'i had below-average comparative advantage in the other five products, including avocados (0.02), bananas (0.16), coffee (0.29), potted flowering plants and foliages (0.47), and cane molasses (0.79). These small RCA scores reflect that Hawai'i had relatively

less market power in these products, but they may, on the other hand, indicate relatively large development potential for Hawai'i in these markets.

We use the RCAV index to measure variations of Hawai'i's comparative advantage in the 11 products between 1993 and 2003. During the period, Hawai'i increased comparative advantage in six products, including coffee (with a RCAV score of 6.01), potted flowering plants and foliages (5.79), bananas (1.99), anthuriums (0.80), cut orchids (0.48), and avocados (0.06). Hawai'i reduced comparative advantage in the other five products, including raw sugar (−4.74), pineapples (−4.74), papayas (−3.83), cane molasses (−1.6), and macadamia nuts (−0.21).

Due to data constraints, the comparative advantage assessment in this publication compares the wholesale value of Hawai'i, U.S. mainland, and foreign countries' agricultural supplies to the U.S., irrespective of the final destinations of these commodities. A more refined assessment in the future should compare the agricultural production of Hawai'i, U.S. mainland, and foreign countries specifically for the U.S. mainland market, which needs to take into consideration Hawai'i's exports to foreign countries as well as foreign imports into the U.S. for transshipment purpose.

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**Table 1. Comparative advantage of selected Hawai'i agricultural products in 2003.**

Products	1993		2003		2003	2003 vs. 1993
	Production (\$000) <sup>1</sup>	Market share (%) <sup>2</sup>	Production (\$000) <sup>1</sup>	Market share (%) <sup>2</sup>	RCA (index) <sup>3</sup>	RCAV (index) <sup>4</sup>
<b>Sugar</b>						
Raw sugar (cane)	242,900	30.58	95,900	15.15	2.62	(4.74) <sup>5</sup>
Molasses (cane)	9,000	21.42	3,100	4.57	0.79	(1.60)
<b>Fruits</b>						
Pineapples	79,850	62.14	101,470	31.02	5.36	(4.74)
Papayas	13,502	60.32	13,015	17.63	3.05	(3.83)
Bananas	4,446	0.44	9,225	0.88	0.16	1.99
Avocados	220	0.09	471	0.09	0.02	0.06
<b>Tree nuts</b>						
Coffee	6,525	0.52	24,070	1.68	0.29	6.01
Macadamia nuts	32,980	66.48	32,330	37.49	6.48	(0.21)
<b>Floriculture products</b>						
Anthuriums	7,156	88.48	5,832	93.26	16.12	0.80
Cut orchids	3,478	25.75	4,724	36.20	6.26	0.48
Potted flowering plant and foliages	28,882	2.42	39,322	2.71	0.47	5.79

1 Wholesale value of Hawai'i production from Statistics of Hawai'i Agriculture (various issues).

2 Ratio of Hawai'i production to the sum of Hawai'i production, U.S. mainland production and foreign imports.

3 A measure of comparative advantage; computed based on the RCA equation.

4 A measure of variation of comparative advantage; computed based on the RCAV equation.

5 Numbers in parentheses are of negative signs.

**Table 2. Hawai'i's competitiveness in raw sugar (cane) in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
<b>Africa</b>			
North Africa	-	-	-
Sub-Saharan Africa	30,326	4.79	0.14
<b>America</b>			
North America	4,330	0.68	0.68
Caribbean	80,354	12.69	(1.39)
Central America	159,012	25.12	8.54
South America	149,714	23.65	5.94
<b>Asia</b>			
East Asia	4,592	0.73	0.03
Middle East	-	-	-
South Asia	3,151	0.50	0.49
Southeast Asia	65,947	10.42	1.59
<b>Europe</b>			
European Union - 25	37	0.01	0.00
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	39,646	6.26	(0.60)
U.S. mainland	-	-	-
<b>Hawai'i</b>	<b>95,900</b>	<b>15.15</b>	<b>(15.43)</b>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). Foreign data from Foreign Agricultural Service trade database (USDA), representing cane raw sugar (HS170111).

2 Compared to 1993.

**Table 3. Hawai'i's competitiveness in cane molasses in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	13	0.02	0.02
Sub-Saharan Africa	-	-	(1.82)
America			
North America	8,429	12.42	4.11
Caribbean	371	0.55	(29.99)
Central America	25,097	36.99	20.63
South America	16,232	23.92	13.88
Asia			
East Asia	239	0.35	0.35
Middle East	14	0.02	0.00
South Asia	5,392	7.95	7.91
Southeast Asia	-	-	-
Europe			
European Union - 25	270	0.40	(1.03)
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	8,690	12.81	2.78
U.S. mainland	-	-	-
<i>Hawai'i</i>	<i>3,100</i>	<i>4.57</i>	<i>(16.85)</i>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). Foreign data from Foreign Agricultural Service trade database (USDA), representing cane molasses (HS170310).

2 Compared to 1993.

**Table 4. Hawai'i's competitiveness in pineapples in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	461	0.14	0.14
America			
North America	6,817	2.08	0.46
Caribbean	140	0.04	(3.39)
Central America	200,788	61.38	31.97
South America	11,916	3.64	3.63
Asia			
East Asia	6	0.00	(0.10)
Middle East	143	0.04	0.04
South Asia	114	0.03	0.03
Southeast Asia	5,287	1.62	(1.67)
Europe			
European Union - 25	-	-	-
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	-	-	(0.00)
U.S. mainland	-	-	-
<i>Hawai'i</i>	<i>101,470</i>	<i>31.02</i>	<i>(31.12)</i>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). Foreign data from Foreign Agricultural Service trade database (USDA), representing pineapples (HS080430).

2 Compared to 1993.



**Table 5. Hawai'i's competitiveness in papayas in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	-	-	-
America			
North America	43,697	59.19	35.14
Caribbean	3,459	4.69	(6.76)
Central America	7,926	10.74	6.60
South America	5,701	7.72	7.70
Asia			
East Asia	-	-	-
Middle East	-	-	-
South Asia	-	-	-
Southeast Asia	23	0.03	0.00
Europe			
European Union - 25	-	-	-
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	-	-	-
U.S. mainland	-	-	-
<i>Hawai'i</i>	<i>13,015</i>	<i>17.63</i>	<i>(42.69)</i>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004) Foreign data from Foreign Agricultural Service trade database (USDA), representing papayas (HS080720).

2 Compared to 1993.

**Table 6. Hawai'i's competitiveness in bananas in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	-	-	-
America			
North America	11,091	1.06	(8.31)
Caribbean	1,022	0.10	0.06
Central America	637,102	60.83	9.13
South America	388,897	37.13	(1.32)
Asia			
East Asia	-	-	-
Middle East	-	-	-
South Asia	-	-	-
Southeast Asia	36	0.00	0.00
Europe			
European Union - 25	-	-	-
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	-	-	-
U.S. mainland	-	-	-
<i>Hawai'i</i>	<i>9,225</i>	<i>0.88</i>	<i>0.44</i>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). Foreign data from Foreign Agricultural Service trade database (USDA), representing fresh bananas (HS0803002020).

2 Compared to 1993.

**Table 7. Hawai'i's competitiveness in avocados in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	-	-	-
America			
North America	51,971	9.43	9.10
Caribbean	14,212	2.58	1.59
Central America	-	-	-
South America	90,229	16.37	15.79
Asia			
East Asia	-	-	-
Middle East	-	-	(0.00)
South Asia	-	-	-
Southeast Asia	-	-	-
Europe			
European Union - 25	-	-	-
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	319	0.06	0.06
U.S. mainland	393,896	71.47	(26.53)
<i>Hawai'i</i>	471	0.09	0.00

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). U.S. mainland data from USDA Fruit and Tree Nuts Situation and Outlook Year Book (2005). Foreign data from Foreign Agricultural Service trade database (USDA), representing avocados (HS080440).

2 Compared to 1993.

**Table 8. Hawai'i's competitiveness in coffee in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	48,227	3.37	(0.90)
America			
North America	92,250	6.44	(10.71)
Caribbean	2,287	0.16	(1.30)
Central America	417,397	29.13	4.12
South America	656,650	45.83	3.89
Asia			
East Asia	530	0.04	0.03
Middle East	4,488	0.31	0.18
South Asia	2,352	0.16	(0.54)
Southeast Asia	156,339	10.91	3.33
Europe			
European Union - 25	4,988	0.35	(0.21)
Other Europe	161	0.01	(0.18)
Former Soviet Union	2	0.00	0.00
Oceania	23,189	1.62	1.12
U.S. mainland	-	-	-
<i>Hawai'i</i>	<i>24,070</i>	<i>1.68</i>	<i>1.12</i>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). Foreign data from Foreign Agricultural Service trade database (USDA), representing Coffee Not Roasted (HS090111).

2 Compared to 1993.

**Table 9. Hawai'i's competitiveness in macadamia nuts in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	24,136	27.99	22.09
America			
North America	121	0.14	0.14
Caribbean	299	0.35	0.35
Central America	6,566	7.61	1.15
South America	4,004	4.64	3.85
Asia			
East Asia	3,944	4.57	4.20
Middle East	-	-	-
South Asia	-	-	(0.01)
Southeast Asia	701	0.81	0.79
Europe			
European Union - 25	24	0.03	0.03
Other Europe	-	-	-
Former Soviet Union	222	0.26	0.26
Oceania	13,897	16.11	(3.86)
U.S. mainland	-	-	-
<i>Hawai'i</i>	<i>32,330</i>	<i>37.49</i>	<i>(28.99)</i>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). Foreign data from Foreign Agricultural Service trade database (USDA), representing the category of Macadamia Nuts under FATUS Import Aggregations.

2 Compared to 1993.

**Table 10. Hawai'i's competitiveness in anthuriums in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	18	0.29	(1.42)
America			
North America	267	4.27	4.27
Caribbean	102	1.63	(7.88)
Central America	7	0.11	(0.03)
South America	24	0.38	0.31
Asia			
East Asia	-	-	(0.07)
Middle East	-	-	-
South Asia	-	-	-
Southeast Asia	-	-	-
Europe			
European Union - 25	3	0.05	0.05
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	-	-	-
U.S. mainland	-	-	-
<i>Hawai'i</i>	5,832	93.26	4.78

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). Foreign data from Foreign Agricultural Service trade database (USDA), representing fresh anthuriums (HS0603017040).

2 Compared to 1993.

**Table 11. Hawai'i's competitiveness in orchids (fresh cut) in 2003.**

Region	Supply (\$000) <sup>1</sup>	Market share (%)	Market share change <sup>2</sup> (%)
Africa			
North Africa	-	-	-
Sub-Saharan Africa	17	0.13	0.13
America			
North America	4	0.03	0.03
Caribbean	-	-	(0.50)
Central America	46	0.35	(2.66)
South America	329	2.52	1.70
Asia			
East Asia	25	0.19	(0.01)
Middle East	-	-	(0.02)
South Asia	-	-	-
Southeast Asia	3,014	23.10	(1.81)
Europe			
European Union - 25	619	4.74	(0.61)
Other Europe	-	-	-
Former Soviet Union	-	-	-
Oceania	459	3.52	1.75
U.S. mainland	3,812	29.21	(8.45) <sup>2</sup>
<i>Hawai'i</i>	<i>4,724</i>	<i>36.20</i>	<i>10.45</i>

1 Hawai'i data from Statistics of Hawai'i Agriculture (2004). USDA Floriculture and Nursery Crops Situation and Outlook Yearbook (2005). Foreign data from Foreign Agricultural Service trade database (USDA), representing fresh dendrobium (HS063107050) and other orchids (HS063107060).

2 Compared to 1993, except for U.S. mainland compared to 2000.